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ABSTRACT

A study examined the relationship between cultural schemata and the reading process to identify the strategies proficient readers employ to develop their understanding of culturally familiar and unfamiliar passages and to examine those strategies in relation to the cultural backgrounds of the readers and the cultural perspectives of the reading materials. Subjects, 30 American and 30 Palauan eleventh grade students (from the Paulau Islands) identified by their teachers as proficient readers, read and responded to a passage concerning funeral rites of the other culture. The subjects' think-aloud protocols and post-reading retelling were analyzed in four phases: (1) phase 1 produced a taxonomy of 22 processing strategies and five categories of strategies; (2) phase 2 determined statistically significant differences in the frequency with which subjects used these strategies when reading culturally familiar and unfamiliar passages; (3) phase 3 identified three patterns in the manner in which individual subjects used the strategies to construct their interpretations of the passages; and (4) phase 4 revealed statistically significant differences in the number of idea units, elaborations, and distortions which appeared in the subjects' retellings. Results indicated that cultural schemata influence the processing strategies readers employ and the level of comprehension they achieve, and that comprehension monitoring strategies seem to provide the strategic scaffolding readers require to develop a unified meaning of text when they lack sufficient background knowledge. (Four tables of data are included; 41 references, the taxonomy of processing strategies, and two appendixes of data are attached.) (RS)

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The Effects of Cultural Schemata on Reading Processing Strategies

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Abstract

This study analyzed in-process verbalizations and post-reading retellings of sixty proficient eleventh grade readers in order to determine the ways in which cultural schemata influence the reading process. Data analysis was conducted in four phases. Phase I produced a taxonomy of 22 processing strategies and 5 categories of strategies. Phase II determined statistically significant differences in the frequency with which subjects used these strategies when reading culturally familiar and unfamiliar passsages. Phase III identified three patterns in the manner in which individual subjects used the strategies to construct their interpretations of the passages. Phase IV revealed statistically significant differences in the number of idea units, elaborations, and distortions which appeared in the subjects' retellings. Results indicate that cultural schemata influence the processing strategies readers employ and the level of comprehension they achieve. Furthermore, the utilization of comprehension monitoring strategies seems to provide the strategic scaffolding readers require to develop a unified meaning of text when they lack background knowledge related to the topic of that text.

Researchers interested in the reading process have recognized for many years that a relationship exists between the cultural background of readers and their comprehension of a given text (Bartlett, 1932; Huey, 1912). These early theorists suggested that an individual who reads a story that presupposes the perspective of a foreign culture will comprehend it quite differently--and in all probability less efficiently--than a native of that culture would. More recently, cognitive psychologists such as Anderson (1977, 1978) and Spiro (1977, 1980) have sought to explain the nature of these differences through the construct of schema theory.

According to schema theorists, knowledge is stored in schematic structures which are organized representations of one's background experiences. These structures or schemata, which are influenced by the culture in which one lives, provide an interpretative framework which a reader may utilize when reading. This process is an active one in which readers use their background knowledge, the situational context, and the cues provided by an author to construct an interpretation of the meaning of a text. Therefore, a passage dealing with a culturally familiar topic will be easier to comprehend--all other factors being equal--than a culturally unfamiliar one since the reader may activate and utilize the relevant schemata to facilitate comprehension.

Numerous research studies have demonstrated this point (Johnson, 1981, 1982; Lipson, 1983; Reynolds, Taylor, Steffensen, Shirley, & Anderson, 1982; Steffensen, Joag-Dev, & Anderson, 1979). However, these studies have focused primarily on product-

oriented measures of comprehension instead of what readers actually do when reading. Thus, their findings offer no direct insights into the ways in which cultural schemata interact with the reading process.

In contrast, this study was undertaken in an effort to learn more about the relationship between cultural schemata and the reading process. Specifically, it sought to identify the strategies proficient readers employed to develop their understanding of culturally familiar and culturally unfamiliar passages, and to examine those strategies in relation to the cultural backgrounds of the readers and the cultural perspectives of the reading materials. Four major questions were addressed:

1. Do proficient readers use different strategies when reading culturally familiar and culturally unfamiliar materials?
2. Are there differences in the frequency with which proficient readers use particular strategies when reading culturally familiar and unfamiliar materials?
3. Are the strategies used for reading culturally familiar and culturally unfamiliar materials consistent across cultures?
4. Is the frequency with which particular strategies are used to read culturally familiar and culturally unfamiliar materials consistent across cultures?

In addition, by measuring the subjects' comprehension of the reading passages, it was possible to determine if the subjects' cultural backgrounds affected their reading comprehension as

previous research (Johnson, 1981, 1982; Steffensen et al., 1979) has concluded.

An examination of those studies which have attempted to identify and/or define strategies in relation to reading reveals a variety of definitions of what a strategy is. For instance, Van Dijk and Kintsch define a strategy as "the idea of an agent about the best way to act in order to reach a goal" (1983, p. 64-5), while Brown views it as "any deliberate, planful control of activities that gives birth to comprehension" (1980, p. 456). Other interpretations include Olshavsky's "purposeful means of comprehending the author's message" (1976-77, p. 656) and Rowe and Rayford's "purposeful actions taken voluntarily to achieve particular outcomes" (1985). Inherent in all of these definitions is intentionality; however, missing, except in Rowe and Rayford's version, is the element of choice in the face of exigencies, an important part of the definition which formed the basis for this investigation. Thus, strategy, as used in this study, was defined as deliberate action that readers take voluntarity to develop an understanding of what they read.

In order to fully understand the relationship between cultural schemata and the strategies readers use, a link must be established between schema theory and cultural background by explaining what is meant by culture and how it affects schema development and reading comprehension. The theoretical bridge which facilitated the establishment of this link was provided by Fleck's theory of thought collectives. According to Fleck, a thought collective is "a community of persons mutually exchanging ideas or maintaining intellectual interaction (Fleck, 1979, p. 39),

the members of which "share in, contribute to, and draw upon the collective for their experiences and ideas" (Fleck, 1979, p. 155). Any act of cognition then must involve the person, the idea, and the thought collective within which the person is operating. This concept has much in common with Brooks' belief that "culture links the thoughts and acts of an individual to the common patterns acceptable to the group" (Brooks, 1975, p. 30), and is also reflected in Kroeber and Kluckhohn's discussion of culture systems as "conditioning elements of further action" (Kroeber & Kluckhohn, 1963, p. 357).

If one accepts the contention that an individual's perceptions and judgments are a function of the assumptions shared by the groups to which he belongs, then culture can be viewed as integrated patterns of learned behavior, unique to a particular social group, which serve as guidelines for selecting and ordering the information with which one is confronted. This process of selecting and ordering sensory input results in the creation and instantiation of schemata which are then available for use with new information. When those data appear in the form of print, an analysis of them, filtered through background knowledge and prior experience, enables a reader to gain meaning.

Method

Design

This study was designed to identify reader strategies and to examine them in relation to two factors: the cultural backgrounds of readers and the cultural perspectives of reading passages. The design was a 2X2 split-plot factorial with two

types of cultural background (American and Palauan) and two types of passage (culturally familiar and culturally unfamiliar). The balance inherent in the 2X2 design was a crucial aspect of this study as it addressed the limitations inherent in unbalanced designs which were discussed previously by Steffensen et al. (1979).

Subjects

Thirty American and thirty Palauan eleventh grade students were randomly selected from 174 proficient readers enrolled in the public schools of a small midwestern city and a small Pacific island nation. Students attending these schools come from all strata of their respective communities and represent a range of socioeconomic levels. They are assigned to their English and Palauan classes on the basis of ability, and of the 20 classes which participated in this study, 9 were rated as average and 11 were rated as above average.

From these classes teachers were asked to identify those students who could adequately read eleventh grade material. In post-rating discussions with the researcher, the teachers stated that they believed this procedure, adapted from Hopkins, George, and Williams (1985), was a valid method of rating their students, and they were able to complete the ratings without any difficulty. This anecdotal evidence supports Hopkins et al.'s contention that "ratings can be...a satisfactory way of obtaining teachers' assessments" (1985, p. 182).

Materials

Two passages were written in the form of letters from a woman to her sister describing the events surrounding a typical

funeral in each culture. A funeral was an appropriate topic because, while common to both Palau and the United States, significant differences exist in the way funerals are conducted in each country. For instance, Palauan funerals are characterized by much more personal involvement by the family and friends of the deceased. They transport the body, build the coffin, dig the grave, and take responsibility for conducting the services. Palauan funerals are also more social in nature with eating, singing, and dancing not usually found at typical American funerals. Another reason for selecting this topic was that the results of a pilot study indicated that it was a topic for which eleventh graders could be expected to have a well-developed schema. Finally, the letter genre, used previously by Steffensen et al. (1979) and Reynolds et al. (1982), was an appropriate one for this study because a letter would be one of the conventional means for Palauans and Americans to convey the type of information contained in the passages.

The Palauan passage was written by a native Palauan while the English passage was written by a native English speaker. In order to establish the content validity of the English passage, i.e. that there was such a thing as a "typical" funeral in the United States and that this passage accurately described one, a minister, a priest, and a person raised as an orthodox Jew were asked "to read a passage which was to be used in a Ph.D. dissertation and identify anything about it that would render it an inappropriate description of the events surrounding a funeral for someone of your religious background." Their suggestions

were incorporated into the text and the final draft was given to them for their approval.

Similar procedures were followed with the Palauan passage. Three Palauans, who were members of the three main religious groups in Palau (Catholic, Evangelical, and Modekngei), read the passage and judged its appropriateness from the perspective of their religious background. Using their criticisms and suggestions as guidelines, revisions were made in the original version and the subsequent draft was reviewed and approved by them.

Once satisfactory versions of the original passages had been completed, both passages were translated into the other language following the back-translation procedures suggested by Brislin (1970). Specifically, a group of four Palauan/English bilinguals, experienced as translators and familiar with the concepts included in the source materials, was identified. Next, each original passage was translated into the target language by one of the bilinguals. These translations were translated back from the target to the source by the other two bilinguals who were unfamiliar with the original versions. Two independent raters, also experienced as translators and with formal linguistic training, then examined the original and back-translated versions for meaning errors, defined by Brislin as "errors that might make differences in the meaning people would infer from reading only one passage" (1970, p. 197). Ten such errors were identified and subsequently discussed with the translators who suggested revisions in either the target or source materials.

Once the translations had been finalized, the passages were analyzed to ensure that they were of comparable difficulty. (See Table 1.) First, the passages were analyzed for T-units, which

Table 1

Descriptive Data: Experimental Passages

	Words	Mean T-unit Length	Idea Units
English (E)	710	13.1	104
Palauan translation (PT)	715	13.2	108
Palauan (P)	729	13.0	108
English translation (ET)	799	13.1	108

consist of "one main clause plus any subordinate clause or nonclausal structure that is attached to it" (Hunt, 1970, p. 4). Mean T-unit length was then computed and used as an index of syntactic complexity. Next, the passages were divided into idea units which, for the purpose of this study, were defined as a verb phrase with a stated or understood subject which, together with its modifiers, forms a single idea. The more common definition of idea units, "functional boundaries based on pausal acceptability" (Johnson, 1970, p. 13), is based on surface structure conventions which ignore the semantic content of the text and was therefore a less appropriate basis for analysis. Finally, a word count was made. Each of these analyses was verified by two independent judges who were native speakers of the language in which each passge was written.

Data Collection Procedures

The researcher met with each subject individually during the school day in an empty office or an empty classroom on the school grounds. At each session the researcher and the subject sat side-by-side at a table on which there was a tape-recorder and a

folder containing the experimental materials. These materials consisted of a sheet of directions, a practice passage, the experimental passages, the buffer tasks, and a background questionnaire. With the exception of the language in which they were written, these materials were identical for both groups of subjects.

Following Olshavsky's model (1976-77), subjects were told that the purpose of the study was to determine how eleventh graders read rather than to test them personally. After they had had the opportunity to reflect on how they read and to express those thoughts, they were given the following directions. These directions, written in each subject's native language and typed on a piece of paper, were read to the subjects orally while they read them silently.

1. You will be given two letters to read.
2. As you are reading, anytime you want, talk out loud about what you are doing and thinking as you read.
3. When you see a red dot [a red dot was placed after each sentence], stop reading and:
   a. explain what was happening in the letter;
   b. explain what you thought about as you were reading;
   c. explain what you did as you read;
   d. discuss anything else about the letter or how you read it.
4. You will not be interrupted or assisted once you begin.
5. When you have finished reading and responding to each letter, I will ask you to complete a questionnaire and then tell me everything you can remember from the letter.

After the directions were read, the subjects participated in a practice session to familarize themselves with the procedure. In the judgment of the reseracher, all subjects were well-accustomed to the procedure by the time they had completed the practice passage. At that point, each subject was given the first letter to read (the letters were presented in counterbalanced order) and subjects were reminded to follow the directions. The researcher did not interrupt or prompt the subjects in any way during the reading-verbalizing process.

Immediately following each passage, students were asked to complete a short questionnaire concerning their reading attitudes and extra-curricular interests. The intent of this filler task was to introduce a retention interval to control for short term memory. After completion of the buffer task, the subjects were asked to tell everything they could remember about the letter. When the retelling was completed, probes were used to elicit any further information the subjects could remember but had neglected to mention during the free recall. In order to ensure that the probes themselves did not provide any additional information, guidelines developed by Tierney, Bridge, and Cera (1979) were followed.

1. Questions only used information already supplied by the subject in the retelling.
2. Questions were not stated in such a way that they might lead the subjects beyond their own understandings.

In the final phase of the data collection process, subjects were asked to respond to a questionnaire designed to assess their

familiarity with the topics of both the culturally familiar and culturally unfamiliar passages. Two independent judges reviewed all of the questionnaires and determined that each group of subjects expressed familiarity with the cultural event (funeral) when it was considered within the context of their own society. However, the judges concurred that one Palauan subject had exhibited extensive knowledge of American funerals, and so that subject was replaced by another selected randomly from the original population.

Data Analysis Procedures

Phase I: First, each subject's tape-recorded responses were transcribed verbatim. The tapes of the American subjects were transcribed by the reseracher while those of the Palauan subjects were transcribed by a native speaker of Palauan. In both cases the transcriptions were cross-checked for accuracy by the researcher who is an English/Palauan bilingual.

Second, the transcribed protocols were compared with the stimulus sentences in each passage and were numbered to correspond to those sentences. Each protocol was then analyzed to determine what cognitive operations the reader undertook when reading the sentence. Once a determination was made, a description of each response was recorded. These descriptions were then examined to determine whether or not they met the definition of strategy, and when appropriate, labels were assigned. The following is a sentence from the English passage, the corresponding protocol of an American subject, and the description and label which were assigned.

Text: They also discussed when they would meet to settle the estate but it wasn't finalized, so they're going to consider it again later.

Subject: That makes me think that this culture or society is a little more advanced than I thought before.

Description: Making a judgment about the appropriateness of an inference he had previously formulated.

Strategy: Confirm/disconfirm an inference.

After the responses were analyzed and the resultant strategies were labeled, all of the strategies were examined to determine if any theoretical basis existed for organizing them into categories. This examination resulted in the identification of five categories of strategies which, if one accepts the interactive, constructive model of reading posited earlier, represent different aspects of processing behavior characteristic of proficient readers as they attempt to develop an integrated understanding of what they are reading. (See Appendix A: Taxonomy of Processing Strategies.)

In developing the Taxonomy, no quantitative criterion was used; that is, regardless of the frequency with which a strategy occurred, it was incorporated into the classification scheme. In some previous studies (Olshavsky, 1976-77, 1978; Hare, 1982), only those strategies which were reported a certain number of times across all subjects were included. However, as Johnston and Afflerbach (1984) note:

> A classification system which requires a minimum number of instances of a specific strategy per subject or across subjects may be less sensitive to individual differences in strategy use. It will also be less sensitive to unique strategies and to strategies that are common across subjects but are infrequently used (p. 317).

When this analysis was finished a complete list of the strategies was compiled, an example of each strategy was identified, and a definition of each strategy was developed. These definitions and examples, together with the experimental passages and a representative sample of five subjects' protocols, were given to two professors of reading with extensive experience in this area of research who then conducted a validity check of the data. Specifically, the experts were asked first to examine the sample protocols and to identify the strategies they believed the subjects had used. When they had completed that task, they compared their strategies with those which had been identified by the researcher and indicated whenever they had minor or major questions about the definition and/or assignment of a particular strategy.

After reviewing the sample protocols and comparing the sets of strategies, both experts agreed that 20 of the 22 strategies represented valid ways of categorizing these data. The two questions that were raised were then resolved through discussion. This process resulted in the elimination of one strategy and the division of another into two strategies. The responses originally assigned to those strategies were then reclassified accordingly.

The list of 22 strategies was then reviewed by two independent judges to determine if they believed there was a basis for grouping the strategies into categories. This review resulted in the identification of five categories which corresponded to those which had been previously identified by the researcher. Although there was originally disagreement regarding the categorization of two strategies, this was resolved through discussion.

The following steps were taken to ensure the reliability of the subjects' performance. These included the care with which the directions for the experimental tasks were developed and administered, the care with which the data collection procedures were set up and implemented, and the completion of a pilot study. The research and planning which were conducted in preparation for each of these steps had a significant effect on the quality of the data these procedures yielded. Therefore, even though the nature of the data precluded the use of more traditional reliabiblity checks, the preceding steps helped to ensure that reliable performance was exhibited by the subjects.

Once the validity and reliability of the data were established, the reliability of the assignment of responses to the various classifications was assessed in the following manner. Three graduate students in reading education were given the list of strategies, the definitions and examples of each, and four randomly selected protocols of American subjects. After a brief training session designed to acquaint them with the task, the graduate students were asked to classify the responses in the

protocols they had received. After each rater had completed all four protocols, their classifications were compared with those of the researcher and the percent of interrater agreement was calculated. The percentage of total agreement across all four raters (the researcher and three graduate students) who rated 239 strategies was 76%. In order to determine the rate of total agreement across three raters (the researcher and two graduate students) the graduate student with the most disparate ratings was eliminated. When this was done, the percentage of agreement increased to 84%.

Phase II: After the validity and reliability checks were completed, the type and frequency of the responses each subject made were tabulated, and cell means and standard deviations were computed for each strategy. Whenever possible, i.e. whenever the ratio of the largest to smallest cell variance did not exceed 4:1, a series of split-plot factorial analyses in which cultural background was a within-subject factor and passage was a between-subject factor was conducted. In those cases when that ratio was greater than 4:1, a square root or reciprocal transformation was performed on the data prior to conducting these analyses. In those instances when the ratio still exceeded 4:1 even after the transformation, or when cell frequencies were 0, it was impossible to analyze those variables inferentially and so descriptive statistics have been used to report them. (See Appendix B: Untransformed Means and Standard Deviations.)

Phase III: When the statistical analysis was completed, an attempt was made to trace the process that individual readers followed to construct their interpretations of each passage.

Although not part of the original design of the study, this procedure was undertaken in the belief that even more could be learned about the comprehension process from this type of analysis of the readers' in-process verbalizations. Of special interest were the points at which the readers related the stimulus sentence to a different portion of the text or to a personal experience.

This approach was based on the assumption that those connections are a prerequisite to the development of a unified meaning of a text and, therefore, an examination of them would yield insight into the comprehension process. As Langer (1985) states: "...understandings along the way are important as they contribute to the reader's final text-world, i.e. to the integrated understanding the reader is left with after having completed the reading of any text" (p. 600-601). For the purposes of this study, these integrated understandings had been previously categorized as Establishing Intersentential Ties and Using Background Knowledge respectively. (See Appendix A.) Thus, the application of any strategy from these categories was considered to be an instance in which the reader 'made connections.'

Once the rationale for this phase of the data analysis had been developed, the protocols of every subject were examined and each occurrence of a strategy from categories IV and V was marked. The frequency and rate of connections were then noted. Next, the changing interpretations the subjects made as they read each passage were traced through their protocols and a sequence of connections which influenced their developing understanding of

the passages was identified. Finally, the intervals between connections were examined in order to identify the types of strategies the subjects used to move from one connection to another. The patterns which emerged from this analysis were then compared across passages and cultural backgrounds.

Phase IV: Each subject's retellings, which had been transcribed and verified in same way as the protocols, were examined in order to determine the number of idea units recalled from each passage. Stein and Glenn's (1979) criterion for accuracy, i.e. preservation of semantic but not necessarily syntactic form, was used. A proportional comprehension score was assigned to each subject's retelling by dividing the number of idea units recalled per passage by the total number of idea units previously identified in that passage. In addition, culturally appropriate extensions of the text (elaborations) and culturally inappropriate modifications of the text (distortions) were identified and totaled for each retelling. After determining that there were no significant order effects for any of the variables, a series of three 2-way analysis of variance was then conducted to test for statistically significant differences in each dependent measure across cultural backgrounds and passages.

The reliability of the scoring procedures was assessed in the following manner. First, two graduate students in reading were given copies of the English passages, the definition of idea unit, and directions which instructed them to parse each passage into idea units according to the definition. The interrater reliability for this procedure was 94% with conflicting judgments being resolved through discussion. Next, the raters were given

four randomly selected retellings of American subjects and were told to identify the number of idea units, elaborations, and distortions in each one. The percentages of agreement for each of these measures were 92%, 88%, and 100% respectively.

In a similar fashion, two native Palauan speakers conducted reliability checks on the protocols and retellings of the Palauan subjects. Although these raters were not specialists in reading, they understood the nature of the study and were cognizant of the procedures which they needed to follow. The interrater reliability for the categorization of 207 strategies was 89% while those for the scoring of the retellings were 90% (idea units), 87% (elaborations), and 95% (distortions).

Results

Overview

Data analysis was conducted in four phases. Phase I, a qualitative analysis of the in-process verbalizations, produced a Taxonomy of Processing Strategies. Phase II, a quantitative analysis of the processing strategies, determined statistically significant differences in strategy usage. Phase III, a qualitative analysis of the processing strategies, identified patterns of strategy usage. Phase IV, a quantitative analysis of the post-reading retellings, compared scores on comprehension measures.

Phase I

The Taxonomy of Processing Strategies which emerged from the initial analysis of the in-process verbalizations contained 22 strategies which were subsequently classified into 5 categories.

Because the Taxonomy was developed from the subjects' protocols, it is not intended to be a complete representation of all possible processing strategies. Nevertheless, it does represent an exhaustive list of the cognitive operations the subjects in this study undertook in attempting to construct their individual interpretations of the experimental passages. This conclusion is based on the assumption that in-process verbalizations are evidence of the covert mental processes which occur during reading. While this assumption is not universally accepted (Garner, 1982; Nisbett & Wilson, 1977), think aloud procedures have been widely defended (Afflerbach & Johnston, 1984; Baker & Brown, 1984; Ericsson & Simon, 1980; Hynd, Alvermann, & Carter, 1984; White, 1980) as a valid means of gaining information about the reading process.

Phase II

Once the strategies and categories of strategies had been identified, they were analyzed in relation to the four research questions posed at the outset of the study. These questions were answered by comparing the frequency with which strategies were used by proficient readers of American and Palauan nationality reading culturally familiar and culturally unfamiliar material. The frequencies of strategies by factors are presented in Table 2.

Table 2

Frequencies of Strategies by Factors

Strategies	Total	Nationality		Passage	
		American (N=30)	Palauan (N=30)	Familiar	Unfamiliar
I. Developing Awareness					
1. Refer to the experimental task	15**	15	0	8	7
2. Recognize loss of concentration	14**	12	2	6	8
3. State failure to understand a portion of the text	148	116*	32	44	104*
II. Accepting Ambiguity					
1. Skip unknown words	10**	9	1	5	5
2. Formulate a question	75**	70	5	24	51
3. Consider alternative inferences	107	76*	31	48	59
4. Suspend judgment	23**	23	0	4	19
III. Establishing Intrasentential Ties					
1. Gather information	201	148	53	107	94
2. Reread	425	196	229	192	233*
a. silently	(185)**	(152)	(33)	(69)	(116)
b. orally	(240)	(44)	(196)	(123)	(117)
3. Paraphrase	2803	1239	1564*	1242	1561*
4. Use context clues to interpret a word or phrase	19	10	9	9	10
5. React to author's style or text's surface structure	77**	77	0	32	45

Reading Processing Strategies

Strategies	Total	Nationality		Passage	
		American	Palauan	Familiar	Unfamiliar
IV. Establishing Intersentential Ties					
1. Read ahead	22	16	6	13	9
2. Relate to previous portion of the text	79	40	39	53*	26
3. Extrapolate from information presented in the text	1109	542	567	976*	133
a. elaborative	(976)	(451)	(525)	(612)*	(13)
b. distortive	(133)	(91)	(42)	(364)*	(120)
4. Confirm/disconfirm an inference	61**	57	4	30	31
V. Using Background Knowledge					
1. Use knowledge of discourse format	160	112*	48	87*	73
2. Refer to previous passage	62**	61	1	42	20
3. Respond affectively to text content	166	158*	8	69	97
4. Visualize	176**	174	2	106	70
a. elaborative	(126)**	(126)	(0)	(71)	(55)
b. non-elaborative	(50)**	(48)	(2)	(35)	(15)
5. Relate to personal experience	178	154*	24	128*	50
a. elaborative	(72)**	(66)	(6)	(55)	(17)
b. non-elaborative	(106)	(88)*	(18)	(73)	(33)
6. Speculate beyond information presented in the text	805	314	491	544*	261
a. elaborative	(620)	(236)	(384)	(528)*	(92)
b. distortive	(185)	(78)	(107)	(16)	(169)*
Total	6735	3619*	3116	3418	3317

* = significant at the .05 level
** = unable to calculate significance

Influence of passage familiarity on strategy usage: An examination of the data presented in Table 2 reveals that the proficient readers who participated in this study employed the same 22 strategies when reading both the culturally familiar and culturally unfamiliar passages. Therefore, no differences were found in the type or range of strategies used across passages. Furthermore, although there was a difference in the total number of times these strategies were used--3418 for the culturally familiar and 3317 for the culturally unfamiliar--this difference was not statistically significant. However, as indicated by the asterisks in Table 2, significant differences did exist in regard to the frequencies with which individual strategies were employed.

Unfortunately, these results only present a partial picture of the differences in strategy usage across passages. Due to the lack of, or in a few cases the extreme heterogeneity of, cell variances, only 19 of the 32 possible comparisons of individual strategies or sub-strategies could be analyzed statistically. Consequently, the frequency counts of the strategies and sub-strategies were collapsed and the totals for the five categories of strategies were compared. (See Table 3.)

This analysis revealed that with the culturally unfamiliar passage subjects used categories I (Developing Awareness) and III (Establishing Intrasentential Ties) significantly more often. Furthermore, category II (Accepting Ambiguity), although not statistically significant, was used more than 1 and 1/2 times as often with the culturally unfamiliar passage. Finally, with the culturally familiar passage categories IV (Establishing Intersentential Ties) and V (Using Background Knowledge) appeared

Table 3

Frequencies of Categories of Strategies by Factors

Categories	Total	Nationality		Passage	
		American (N=30)	Palauan (N=30)	Familiar	Unfamiliar
I. Developing Awareness	177	143*	34	58	119*
II. Accepting Ambiguity	215	178*	37	81	134
III. Establishing Intrasentential Ties	3525	1670	1855	1582	1943*
IV. Establishing Intersentential Ties	1271	655	616	1072*	199
V. Using Background Knowledge	1547	973*	574	976*	571

* = significant at the .05 level

significantly more often in the subjects' responses.

Influence of cultural background on strategy usage: Referring again to Table 2, it is evident that both the range and frequency of the strategies used to read the culturally familiar and culturally unfamiliar passages did vary across nationalities. The first cross-cultural difference to note is that the Americans employed a wider range of strategies (22) than the Palauans (19). The second notable cross-cultural difference was in the total number of strategies used across nationalities. The Americans used significantly more strategies (3619) than did the Palauans (3116). Another notable cross-cultural difference relates to the frequency with which particular strategies were used. The Americans used five strategies significantly more often than the Palauans while the Palauans used only one strategy significantly more often than the Americans.

When considering these findings, one must recognize that, since the researcher is a native speaker of English who was born in the United States, the results were limited by the researcher's ability to communicate successfully in Palauan and by his understanding of Palauan culture. Although he lived in Palau for a total of nine years, taught courses in Palauan history and culture, and has a 4+ (on a 5 point scale) Foreign Service Institute rating in the Palauan language, the fact that the researcher is not a native Palauan may have affected the collection and analysis of the data.

A final cross-cultural point of interest concerns differences in categories of strategies. As with the analysis of passage familiarity and strategy usage, the frequency counts of

strategies and sub-strategies were collapsed and totaled for each category. An examination of the data in Table 3 indicates that the Americans used categories I (Developing Awareness), II (Accepting Ambiguity), and V (Using Background Knowledge) significantly more often than the Palauans, while the Americans' use of category IV (Establishing Intersentential Ties) also differed in that direction but not significantly so. On the other hand, the Palauans had more responses in category III (Establishing Intrasentential Ties) but the difference was not statistically significant.

Phase III

While the quantitative analysis presented in Phase II provided interesting and important answers to the primary research questions posed at the outset of this study, the true significance of the data could not be assessed solely by means of statistical tests. Instead, it was necessary to go beyond this quantitative aspect to a qualitative analysis of the data in order to develop a more complete understanding of the manner in which the subjects used the processing strategies to facilitate their comprehension of the culturally familiar and culturally unfamiliar passages. The specific questions which guided this phase of the data analysis were:

1. Are there patterns in the manner in which the subjects used the strategies to construct their individual interpretations of the passages?
2. If so, did the patterns vary as a result of passage familiarity and/or cultural background?

This analysis was predicated on a belief in the constuctive nature of the reading process. Described elsewhere as building a model (Collins, Brown, & Larkin, 1980), establishing an envisonment (Langer, 1985), and reconstituting a text world (de Beaugrande, 1981), reading was defined earlier as an active process in which readers use their background knowledge, the situational context, and the cues provided by an author to construct an interpretation of the meaning of a text. In Phase III that process was traced through the protocols of the subjects in an effort to identify patterns of strategy usage which may have existed across nationalities and/or passages. That analysis resulted in the identification of the following patterns.

Rate of connections: When reading the culturally familiar passage, an overwhelming majority of the subjects made connections more quickly than when they read the culturally unfamiliar passage. This pattern was true in 87% of the protocols across both nationalities. Within nationalities, the rate was 77% for the Americans and 97% for the Palauans. Given the fact that the Phase II analysis indicated that these connections occurred more frequently with the culturally familiar passage, this finding is not surprising. Nevertheless, it is significant.

Sequence of connections: When reading the culturally familiar passage, most subjects followed a 'genre-personal experience-concluding statement' sequence of connections in their protocols. Subjects who followed this pattern would start by making connections with the letter genre. Typical comments were: "We know it's a letter from the heading 'Dear Lorrie'." "After

the 'Dear Lorrie,' it's just an introduction to the letter." Once they had made that connection, the readers would begin referring to concrete, personal experiences, such as: "It makes me think of my grandfather's funeral." "I can remember my grandmother breaking down when they opened the coffin." These personal references generally continued until the reader approached the end of the text. At that point a variety of concluding statements became evident. These included evaluative statements ("I don't like funerals!"), references to genre ("She's closing out the letter."), hypotheses ("These two girls must have a pretty good relationship for sisters."), and gist statements ("Apparently this letter is just to update Lorrie on what all has happened."). All of these seem to represent attempts by the readers to synthesize what they had read and in that way achieve a sense of closure. This pattern was evident for 75% of all the subjects, although the trend was stronger in the Americans' protocols (83%) than in those of the Palauans (67%).

When reading the culturally unfamiliar passage, an even more significant cross-cultural difference emerged. 87% of the American subjects followed the same 'genre-personal experience-concluding statement' pattern as in the culturally familiar passage, but because these connections occurred less frequently and more slowly in the culturally unfamiliar passage, the intervals between connections were more protracted. Nevertheless, the majority of American subjects were eventually able to construct some type of concluding statement.

On the other hand, after reading the culturally unfamiliar

passage, 84% of the Palauan subjects failed to make a concluding statement. This was true despite the fact that they usually made the 'genre-personal experience' connection, albeit less frequently than the Americans. The final pattern to emerge from this phase of the data analysis helps to explain this difference.

Intervals between connections: Since the frequency and rate of connections were higher with the culturally familiar passage, one sees more prolonged intervals between connections in the culturally unfamiliar passage. An examination of the intervals revealed significant cross-cultural differences in regard to the types of strategies each group of subjects utilized during these periods. Furthermore, these differences are consistent with the findings of Phase II. Specifically, during these intervals the Americans used category I (Developing Awareness) and category II (Accepting Ambiguity) significantly more often than the Palauans, while the Palauans used category III (Establishing Intrasentential Ties) more often than the Americans. An examination of a representative protocol will help illustrate those differences.

American #1: culturally unfamiliar

1. Hmm...after the...the name addressing the letter, my mind just kind of explodes there, wondering who this is, where he's from, what nationality, who in the world he could be.
2. At the second line I'm still wondering.
3. After the third line, still yet it's prolonging the agony of wondering who's...who's writing, who's receiving, where either of them are, wondering, yeah, wondering where they are.

4. Um...in the third line here I guess that's a name because of the context, saying of how someone who I just assume they are related to somehow or another, isn't well.
5. And her next line tells of his death.
6. And that they...and how the family seemed to have suffered.
7. And this next line is not confusing but kind of oddly unique in that it says the women went to the hospital and the men went to look for materials for the coffin, which is not very...is not the customary way of doing things in our country. but again I have no idea of where this is going on. And that makes me think that this is a culture foreign to the United States.
8. It says how um...the person he's writing to is probably very sad and that he a...he regrets or that we regret that he is so far away, obviously they're not in the same part of the world or at least not really close.

As one can see from the preceding excerpts, American #1 was actively engaged in the process of constructing his interpretation of the text. When he was unable to make connections, he was first of all aware of that fact. Then, in the interim between connections, he questioned and hypothesized as he attempted to move from one connection to another.

The Palauan subjects, however, exhibited a more passive approach to the task. Although they sometimes started by generating hypotheses regarding the letter and the funeral, they

quickly began to focus almost exclusively on the text, which then became the primary source for their verbalizations. Hence the trend described above: that American and Palauan subjects employed different types of strategies during the intervals between connections. Whereas the Palauans became increasingly text-based at those times, i.e. usually utilized strategies from category III, the Americans were more flexible in their use of strategies and as a result seemed to be more successful in their search for a global understanding of the passage.

Phase IV

Phase IV involved the quantitative analysis of each subject's retellings of the culturally familiar and culturally unfamiliar passages. The first step in this procedure was to conduct an analysis of variance for each dependent measure (idea units, distortions and elaborations) to determine whether there had been a significant main effect for passage order. The results showed that there were no significant order effects for any of the variables, so three 2-way analysis of variance were conducted in which cultural background was a between-subjects factor and passage was a within-subjects factor. (See Appendix C: Analysis of Variance Tables for Comprehension Measures.) These results, summarized in Table 4, indicated a significant effect of passage on each dependent measure.

Specifically, both the American and Palauan subjects recalled significantly more idea units from the culturally familiar passage than from the culturally unfamiliar one, [$F(1,30) = 36.543$, $p<.01$]. In addition, the number of distortions and elaborations each nationality made differed across passages;

that is, significantly more distortions appeared in the subjects' retellings of the culturally unfamiliar passages than in their retellings of the culturally familiar ones, [F (1,30) = 99.682, p<.01]. Similarly, the number of elaborations which appeared in the subjects's retellings of the culturally familiar passages was significantly greater than that which was evident in their retellings of the culturally unfamiliar passages, [F (1,30) = 91.058, p<.01].

Table 4

Mean Performace on Comprehension Measures

	Nationality			
	Americans		Palauans	
Measures	Familiar Passage	Unfamiliar Passage	Familiar Passage	Unfamiliar Passage
Idea Units	35.1	21.5	33.2	19.2
Distortions	.3	4.6	.2	4.2
Elaborations	4.1	.6	6.9	.4

The analysis of the elaborations data also revealed a significant main effect for cultural background [F (1,30) = 6,238, p<.01] as well as a significant nationality X passage interaction, [F (1,30) = 7.941, p<.01]. These results indicated that in the retellings of the culturally familiar passage the Palauans had significantly more elaborations than the Americans. In the next section this finding will be considered in relation to the extent to which American and Palauan adolescents are involved in funerals in their respective cultures.

Discussion

Phase I

The first category in the Taxonomy is Developing Awareness. This category evolved from an examination of the strategies that revealed certain types of cognitive operations which were focused on the subjects' growing sense of awareness regarding the progress they were making and the problems they were encountering while reading the experimental passages. Thus, Developing Awareness represents one aspect of the comprehension monitoring process. An important caveat to note when considering this category is that simply because the subjects did not report a problem does not mean that they had not encountered one. Consequently, the frequency counts for Developing Awareness do not in all likelihood represent every instance in which the readers' concentration waivered or their understanding faltered. Nevertheless, the totals do provide insight into the types of strategic behaviors readers employ when problems occur.

The second category of strategies, Accepting Ambiguity, is an extension of Developing Awareness. Whereas the latter subsumes instances in which the readers recognized a problem existed, the former represents a realization on the part of the readers that, although the comprehension process was temporarily short-circuited, they should not abandon their search for a unified understanding of the text. Instead, the subjects accepted the fact that they were not going to make a connection at that point in their reading, and as a result they attempted to implement a strategy or series of strategies which would allow them to continue to a point where a connection would be possible.

The third category is Establishing Intrasentential Ties. When employing strategies in this category, the readers were attempting to develop an understanding of the particular stimulus sentence they were reading. These attempts were apparently made without any overt effort to relate the stimulus sentence to other portions of the text or to the subjects' own background knowledge. Consequently, the strategies in this category are very text-based in nature.

The fourth category in the Taxonomy is Establishing Intersentential Ties. As the label implies, this category represents a step beyond Establishing Intrasentential Ties in that readers strove to make connections by relating the stimulus sentence to other portions of the passage. As Langer has demonstrated (1985), integrating local understandings across different parts of a text is a very significant aspect of developing an understanding of a text as a whole. Consequently, this is a very important category in terms of understanding the processing behavior of proficient readers.

The final category of strategies is Using Background Knowledge. This category represents another way in which the subjects attempted to build up their understanding of the passages. In this case, the stimulus sentence was related to some aspect of the readers' background knowledge. The in-process verbalizations indicate that this was a particularly powerful category; that is, when subjects could and did do this, it seemed evident that they were actively engaged with the text and as a result were probably understanding it more fully than when they were unable to make this type of connection.

Phase II

Differences in the frequency with which readers employed particular strategies were evident across passages. In all cases the strategies used significantly more often with the culturally familiar passage came from categories IV and V. These findings indicate that when reading culturally familiar materials readers are more apt to make attempts to establish intersentential ties and use background knowledge. The following excerpts from the protocols of two American subjects reading the culturally familiar passage illustrate this point.

> Like I said before, when I imagined there was a preacher...well, since I already thought about it, it's easier for me to go to the next sentence when I already know kind of what's going to happen.
>
> This story has really reminded me of my grandparents' death and just kind of...it's easier to relate to and when I went along I would remember things from [their death] and that makes [the passage] easier to remember.

In addition, three of the four strategies used significantly more often with the culturally unfamiliar materials came from categories I, II, and III. This suggests that when reading culturally unfamiliar materials readers encounter difficulty in relating stimulus sentences to other portions of the text or to their own background knowledge. As a result, they rely more heavily on strategies from Developing Awareness, Accepting Ambiguity, or Establishing Intrasentential Ties. Note the following example taken from the protocol of an American subject reading about the Palauan funeral.

> And it says the women who must sit with the wife around the coffin started crying when they saw...the boat...That makes me wonder what it was about the boat that made them cry...what happens when the boat arrived. And it talks about the women who must sit around the coffin, which it doesn't sound like an American custom, so...I don't know...I ...I...start to wonder about what their customs are.

An analysis of the data related to the influence of cultural background on strategy usage revealed cross-cultural differences. Americans utilized a wider range of strategies (22 to 19) as well as a significantly greater total number of strategies (3619 to 3116). These results indicate that the Americans' repertoire of processing strategies may be greater than that of the Palauans. In addition, and perhaps more significantly, the Americans exhibited a greater willingness to apply strategies that seemed to indicate a flexibility and penchant for risk-taking that were lacking in the Palauan responses.

This finding seems to be consistent with the cultural background and instructional history of the Palauan subjects. Palauan culture in general discourages the type of behavior that the Americans exhibited (Nevin, 1977). In addition, the rote memorization and oral recitation which characterize Palauan schools simply reinforce the message that the students receive from the culture at large (Pritchard, 1980). These converging forces suggest that strategy usage may be determined by a combination of culture and educational practice.

Phase III

Patterns were identified from the manner in which the American and Palauan subjects constructed their individual interpretations of the passage. These patterns were related to (1) the rate at which the readers attempted to integrate their local understandings into a global understanding of the text, (2) the sequence of connections which influenced their developing understandings of the passages, and (3) the types of strategies subjects employed to move from one connection to another.

The first pattern to emerge from an analysis of the protocols was that the rate of connections varied across passages. Specifically, when reading the culturally familiar passage, both American and Palauan subjects were able to integrate their local understandings of that text more quickly than when they read the culturally unfamiliar passage. This finding indicates that having the relevant cultural schemata for a reading passage facilitates the reading process.

The second pattern, which became evident after an examination of the protocols, was that the majority of readers followed a 'genre-personal experience-concluding statement' sequence of connections as they read the culturally familiar passage. The subjects who conformed to this pattern seemed to rely on their knowledge of the letter genre and funeral schema to generate a concluding statement. For example:

> I think personal experiences play a big part in understanding this letter. I mean everything's like, if I hadn't been to a few funerals, I wouldn't have been so understanding. I wouldn't have understood as

much...especially about listening to the people talking and feeling better.

The same 'genre-personal experience-concluding statement' sequence of connections emerged from an analysis of the protocols of the Americans reading the culturally unfamiliar passage. The only difference was that the connections occurred less frequently, so the intervals between the connections were more protracted. However, an overwhelming majority of the Palauan subjects were unable to make a concluding statement even though in most cases they had made the 'genre-personal experience' connection. As a result, what one usually sees when examining the Palauan protocols of the culturally unfamiliar passage, is a steadily increasing gap between connections until the connections disappear altogether. This suggests that the Americans had a more effective way of moving from one connection to another when reading the culturally unfamiliar passage. The final pattern identified in this phase of the data analysis provides one possible explanation for that conclusion.

During the intervals between connections the Americans relied to a much greater extent than the Palauans on strategies from categories I and II. The Palauans, on the other hand, relied almost exclusively on strategies from category III. In fact, when they were unable to make connections in the culturally unfamiliar passage, the Palauans' primary strategy was to paraphrase the text. This pattern strongly suggests that the Palauans' reluctance, and/or inability, to utilize strategies from categories I and II during these intervals negatively affected their processing of the passages.

Phase IV

The results of the Phase IV data analysis support a schema-theoretic perspective of reading comprehension; that is, readers who possess accurate, relevant schemata related to the material they are reading will in all likelihood comprehend that material quite differently, i.e. more effectively, than readers who lack those schemata. The significant differences across passages in the number of idea units recalled confirm this conclusion.

The differences in the number of distortions which surfaced in the subjects' retellings also support this view. Defined earlier as culturally inappropriate modifications of the text, distortions involve either "stating a text element in such a fashion that a native [of the culture] would say the point had been lost [or including] outright intrusions from one's own culture" (Steffensen et al., 1979, p. 15) For example, the Palauan retellings of the American passage contain very few references to a hearse or limousine, both of which were mentioned in the passage and both of which are integral parts of an American funeral procession. On the other hand, when the Americans recalled the Palauan burial service, they often described the people as being dressed in black, a traditional aspect of American funerals which is not observed in Palau.

Schema theory also predicts elaborations, or culturally appropriate extensions of the text, where gaps exist in a text. As previously noted, the results of this aspect of the data analysis are consistent with this perspective. For instance, the Palauan passage states that "some [men] went to kill the pig."

Although this is the only time the pig is mentioned, the retellings of the Palauans contain numerous references to the size of the pig (an important factor in Palauan culture) and graphic descriptions of its killing (a common event in Palauan culture).

The analysis of the elaborations data also indicated that the retellings of the Palauans had significantly more elaborations than those of the Americans. This finding can be explained by the different roles that American and Palauan adolescents play in funerals in their respective cultures. Palauans, at a relatively early age, become actively involved in funerals which take place in their village. During their pre-teen years, their responsibilities might include running errands (boys) and serivng food (girls). During adolescence the boys would be expected to help dig the grave or kill a pig while the girls would assist in preparing food or ceremonial dancing. Whatever the specific tasks are, the point is that Palauan adolescents are participants in the process.

American youths, on the other hand, are primarily observers. Attendance at a funeral usually involves going to a viewing and, if one is a close friend or relative of the deceased, attending the burial service at the cemetery. As a result, their involvement in funerals is of a qualitatively different nature than that of their Palauan counterparts. Thus, it is not surprising that the Palauans' retellings of the culturally familiar passage contained significantly more elaborations.

In all of the examples cited above, and in many others like them, the influence of the readers' native culture, or the

divergence of the readers' schemata from the schemata presupposed by the text, was clearly evident in the subjects' retellings. These findings, together with the results of the Phase IV statistical analysis, clearly indicate that differences in cultural schemata are a significant source of individual differences in reading comprehension.

Conclusions

The results of this investigation clearly and convincingly underscore the power of cultural schemata as a factor which affects the way proficient adolescent readers process and comprehend text. Based on these results, the following conclusions are posited:

1. Cultural schemata greatly influenced the processing strategies readers employed and the level of comprehension they achieved.
2. Categories I (Developing Awareness) and II (Accepting Ambiguity) seemed to provide the strategic scaffolding readers required to develop a unified meaning of text when they lacked background knowledge related to the topic of that text.
3. The categories of strategies identified in this study represent a potentially comprehensive framework for classifying the cognitive operations readers undertake when processing text.

Reading is an active process in which readers use their background knowledge, the situational context, and the cues provided by an author to construct an interpretation of the

meaning of a text. The exact nature of this process, as well as its ultimate success, depends on a variety of factors. The results of this study indicate that two of the most important of these factors are the cultural background of the reader and the cultural perspective of the text.

The schemata embodying readers' background knowledge about the content of culturally familiar materials facilitate the integration of local understandings and enable readers to develop a unified meaning of the text. When reading culturally unfamiliar materials, readers lack the relevant schemata, resulting in fewer connections and greater ambiguity. Those readers who recognize that this is often the case in reading, and who accept the fact that they are unable to make a connnection at a particular point in a text, are able to persevere and continue the search for a unified meaning. However, those readers who abandon the search for a global understanding and rely instead on text based connections, are less likely to be successful.

These findings suggest that reading is a content specific activity; that is, when the content of reading materials changes, processing behavior changes as well. If this is indeed the case, then one cannot assess the reading process independent of content. Thus, instead of "good" and "poor" readers, there may simply be good and poor reading behaviors which characterize most readers at different times.

Implications

Research

This investigation has extended the scope of previous research by utilizing proficient readers' in-process

verbalizations to identify the strategies they used while reading culturally familiar and unfamiliar passages. The findings of this investigation can now be used as the basis for future studies of related issues. Several suggestions for these investigations follow.

First, the design limitations inherent in this study need to be addressed. The population from which the experimental sample was selected as well as the topic of the experimental passages limit the generalizability of the findings. Consequently, replications of this study utilizing different subjects and topics are necessary.

Second, the results of this study are based on the in-process verbalizations of proficient readers. An important variation in this design would be to identify and compare the processing strategies of proficient and non-proficient readers to determine if the strategies of non-proficient readers were similar to those of the Palauan subjects reading the culturally unfamiliar material; that is, do they have trouble making connections, and if so, which strategies and categories of strategies do they rely on at those times?

Finally, a great deal remains unexplained regarding the relationship between the strategies readers use and the comprehension they achieve. Preliminary results from this study suggest that differences in comprehension may be related to the different strategies readers employ. Future research needs to explore this issue more thoroughly.

Pedagogy

A major instructional concern is whether students can and should be taught to use strategies. If additional studies support the findings of this investigation, and also determine that strategies are amenable to instruction, the strategies that the proficient readers in this study used for dealing with difficulties in understanding could provide a model for instructing less-proficient readers.

Furthermore, results of this study reinforce those of previous research which indicate that cultural schemata greatly influence reading comprehension. The more knowledge students have regarding a particular topic prior to reading about it, the more likely they will be to comprehend it. Therefore, readers must be provided with the opportunity to develop or activate relevant schemata related to their reading materials.

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Appendix A

Taxonomy of Processing Strategies

I. Developing Awareness is a category which includes strategies in which the reader:

1. refers to the experimental task;
2. recognizes loss of concentration; or
3. states failure to understand a portion of the text.

II. Accepting Ambiguity is a category which includes strategies in which the reader:

4. skips unknown words;
5. formulates a question;
6. considers alternative inferences; or
7. suspends judgment.

III. Establishing Intrasentential Ties is a category which includes strategies in which the reader:

8. gathers information;
9. rereads;
10. paraphrases;
11. uses context clues to interpret a word or phrase; or
12. reacts to author's sytle or text's surface structure.

IV. Establishing Intersentential Ties is a category which includes strategies in which the reader:

13. reads ahead;
14. relates the stimulus sentence to a previous portion of the text;
15. extrapolates from information presented in the text; or
16. confirms/disconfirms an inference.

V. Using Background Knowledge is a category which includes strategies in which the reader:

17. uses background knowledge of the discourse format;
18. refers to the previous passage;
19. responds affectively to text content;
20. visualizes;
21. relates the stimulus sentence to personal experience; or
22. speculates beyond the information presented in the text.

Appendix B

Means and Standard Deviations

	A:CF		A:CU		P:CF		P:CU	
Strategy	M	SD	M	SD	M	SD	M	SD
1	.27	.69	.23	.57	0	0	0	0
2	.20	.48	.20	.48	0	0	.07	.25
3	1.20	1.90	2.67	3.28	.27	.64	.80	1.86
4	.17	.91	.13	.35	0	0	.03	.18
5	.73	1.39	1.60	1.92	.07	.25	.10	.31
6	.90	1.60	1.63	2.24	.70	1.37	.33	1.03
7	.13	.35	.63	2.22	0	0	0	0
8	2.47	4.44	2.47	3.99	1.10	1.58	.67	.76
9A	2.20	3.99	2.87	4.54	.10	.40	1.00	3.29
9B	.63	1.03	.83	1.26	3.47	9.08	3.07	8.59
9	2.83	4.50	3.70	5.10	3.57	9.38	4.07	10.74
10	19.53	12.07	21.77	10.58	21.87	9.41	30.27	8.53
11	.17	.38	.17	.46	.13	.35	.17	.75
12	1.07	1.28	1.50	2.50	0	0	0	0
13	.30	.70	.23	.68	.13	.57	.07	.37
14	.80	1.06	.53	.86	.97	1.16	.33	.71
15A	8.67	5.26	6.37	4.28	11.73	5.64	5.77	4.08
15B	.10	.31	2.93	2.50	.33	.55	1.07	1.14
15	8.77	5.27	9.30	5.34	12.07	5.70	6.83	4.38
16	.93	1.28	.97	1.38	.07	.37	.07	.25
17	1.67	1.35	2.07	1.28	1.23	1.22	.37	.56
18	1.40	3.54	.63	1.10	0	0	.03	.18
19	2.13	2.54	3.13	4.06	.17	.38	.10	.31
20A	2.37	5.27	1.83	3.98	0	0	0	0
20B	1.17	2.15	.43	.94	0	0	.07	.37
20	3.53	6.52	2.27	4.44	0	0	.07	.37
21A	1.70	3.53	.50	.86	.13	.43	.07	.37
21B	2.10	3.06	.83	1.68	.33	.84	.27	.78
21	3.80	5.45	1.33	2.14	.47	1.17	.33	.92
22A	5.83	5.68	2.03	2.06	11.77	8.85	1.03	1.97
22B	.23	.94	2.37	2.37	.30	.75	3.27	3.49
22	6.07	5.58	4.40	3.76	12.07	9.23	4.30	4.69
Category								
I	1.67	2.28	3.10	3.56	.27	.64	.87	2.03
II	1.93	2.91	4.00	4.60	.77	1.57	.47	1.07
III	26.07	12.85	29.60	11.90	26.67	10.65	35.17	8.00
IV	10.80	6.13	11.03	5.93	13.23	6.38	7.30	4.81
V	18.60	13.37	13.83	8.00	13.93	10.30	5.20	5.74
TOTAL	59.07	11.47	61.57	13.19	54.87	9.39	49.00	11.51

Appendix C

Analysis of Variance Tables for Comprehension Measures

Analysis of Variance: Idea Units

Source	df	ss	ms	F ratio	P
Passage	1	5713.200	5713.200	36.543	P<.05
Nationality	1	132.300	132.300	.846	NS
Interaction	1	1.200	1.200	.007	NS
Error	116	18135.800	156.343		
Total	119	23982.500			

Analysis of Variance: Distortions

Source	df	ss	ms	F ratio	P
Passage	1	508.408	508.408	99.682	P<.05
Nationality	1	1.875	1.875	.368	NS
Interaction	1	.408	.408	.080	NS
Error	116	591.633	5.100		
Total	119	1102.325			

Analysis of Variance: Elaborations

Source	df	ss	ms	F ratio	P
Passage	1	740.033	740.033	91.058	P<.05
Nationality	1	50.700	50.700	6.238	P<.05
Interaction	1	64.533	64.533	7.941	P<.05
Error	116	942.733	8.127		
Total	119	1798.000			